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optimapak

High Performance Chromatography Columns

RStech Corporation

www.rstechcorp.com



● Introduction



OptimaPak is designed to meet the highest demand in HPLC, SFC and SMB from analytical to process scale.



- All derivatized OptimaPak phase are fully endcapped
- High reproducibility
- Excellent chemical stability
- High performance spherical silica gel
- The most symmetrical peak shape
- All columns are individually tested
- Competitive prices and high quality

Advantages of OptimaPak silica

The uniqueness of OptimaPak high performance spherical silica is the combination of:

- high surface area
- mechanical strength

Other outstanding properties are:

- chemical purity
- chemical stability
- optimized surface properties
- well-defined pore structure

OptimaPak HPLC silica consists of perfectly spherical, totally porous particles, a narrow particle size distribution for high efficiency, low pressure drop and best total economy in chromatographic purifications.

In figures 1 and 2, the SEM photographs of OptimaPak 3.5 μm and 10 μm are shown.

Fig. 1 - OptimaPak 3.5 μm

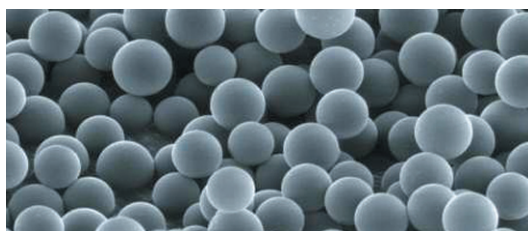
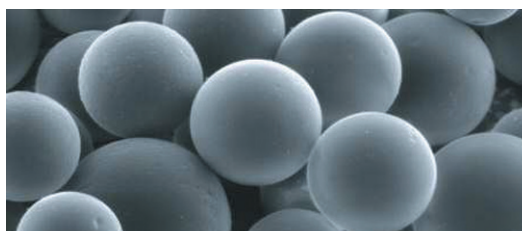


Fig. 2 - OptimaPak 10 μm



● High performance spherical silica gel

High performance spherical silica for analytical to process scale liquid chromatography. OptimaPak 100 Å is manufactured using monofunctional silanes, and is fully end-capped. This gives high reproducibility and chemical stability.

PRODUCT CHARACTERISTICS

Particle sizes:

3.5 μm , 5 μm , 10 μm ,

Particle size distribution:

dp_{90}/dp_{10} : < 1.70 (10 μm)
< 1.55 (5 μm)
< 1.45 (3.5 μm)

Spec surface area:

320 m^2/g (multi-point BET)

Pore volume:

0.9 ml/g (N_2 -adsorption)

Pore size:

110 Å (N_2 -adsorption)

Pore size distribution:

80% \pm 25 Å (N_2 -adsorption)

Chemical purity:

Typical figures (AAS or ICP):

Na: < 10 ppm

Al: < 5 ppm

Fe: < 5 ppm

Coverage:

(elemental analysis)

C4: 8% C, 3.8 $\mu\text{mol}/\text{m}^2$

C8: 12% C, 3.7 $\mu\text{mol}/\text{m}^2$

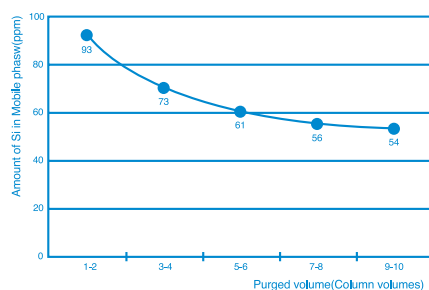
C18: 20% C, 3.5 $\mu\text{mol}/\text{m}^2$

NH2: 1.7% N, 4.5 $\mu\text{mol}/\text{m}^2$

● Excellent chemical stability:

OptimaPak derivatized phases are stable between pH 1.5 and 10 and as high as 12 under certain conditions.

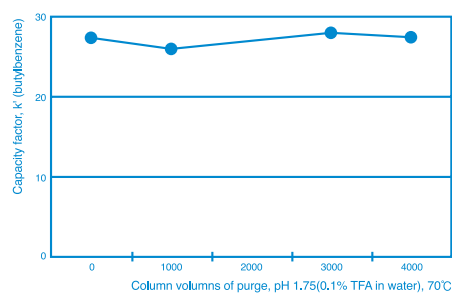
Fig. 3



The leakage of silica and bonded phase after the treatment at pH > 13

Column : OptimaPak C18, 4.6x25cm (new column)

Fig. 4



Values of k' for butylbenzene plotted against the number of column volume of purge

Column : OptimaPak C18, 4.6x25cm (new column)

● Superior peak shape

In this comparison test of columns packed with 5 μ m particles, OptimaPak C18 column shows the highest USP-Plate count and the lowest USP tailing factors for Phenanthrene peak.

Testing Condition

Mobile Phase : MeOH/H₂O : 90/10
 Flow Rate : 1.0ml/min
 Detection : UV 254nm
 Temp. : 25°C

Peak No & Name

1. Phenol
2. Toluene
3. Biphenyl
4. Phenanthrene

Fig. 5: Peak

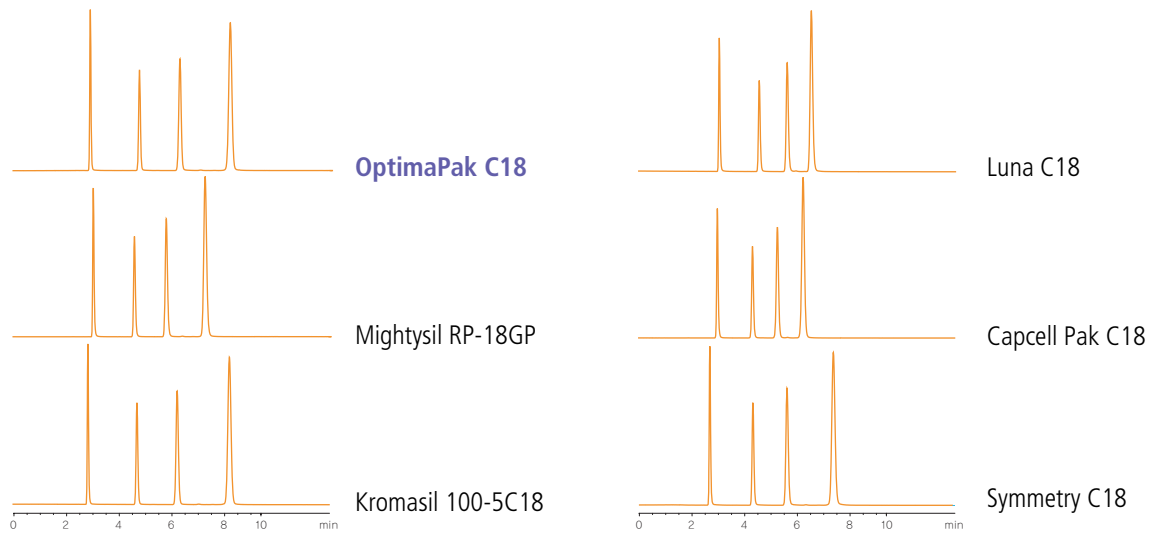


Fig. 6: USP plate count

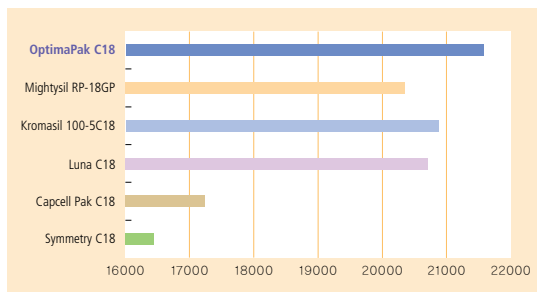
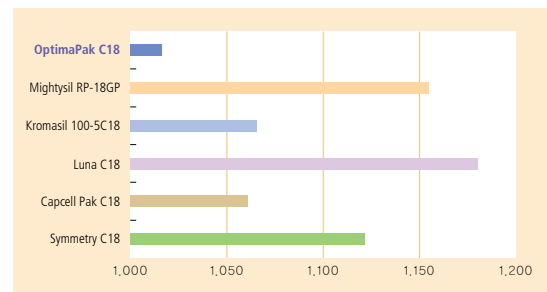


Fig. 7: USP tailing factor

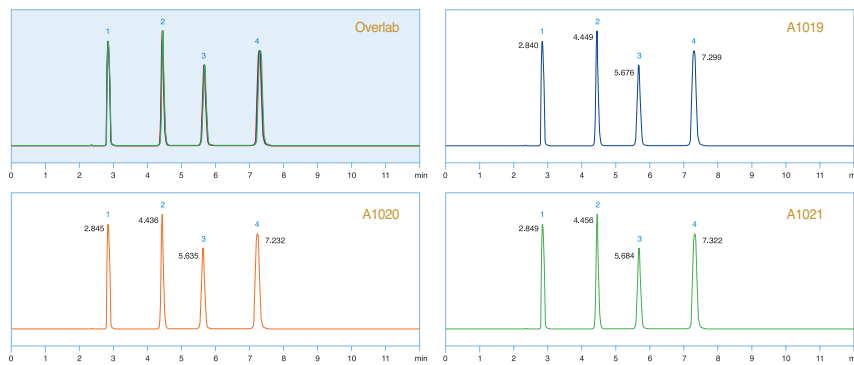


● Highest reproducibility

The manufacturing of OptimaPak spherical silica is done according to the well-known sol-gel technique which gives optimized chemical and mechanical stability, pore structure and reproducible surface area.

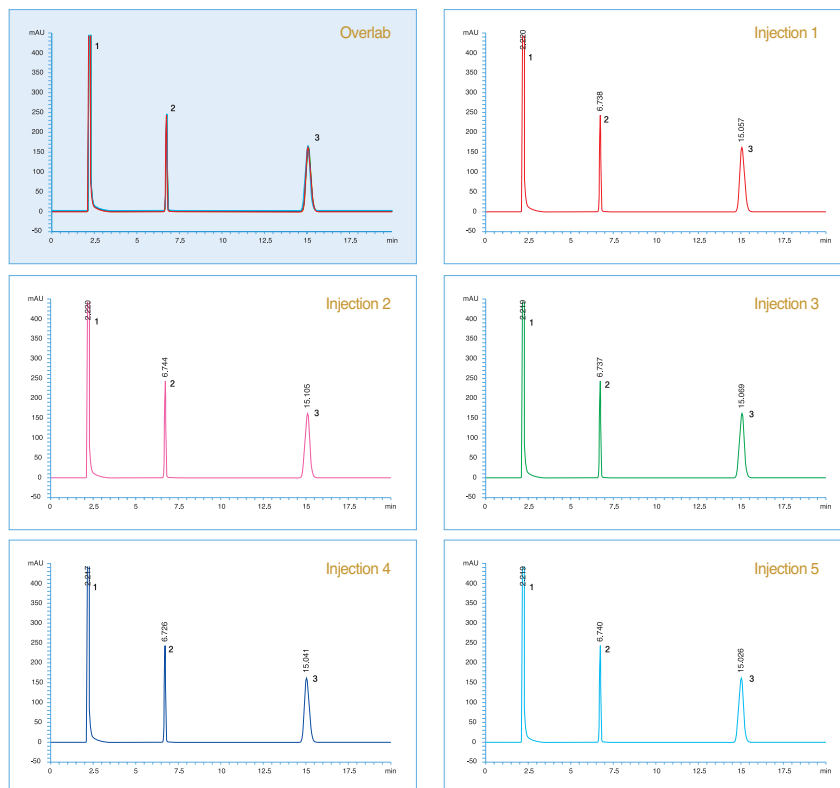
Lot-to-lot reproducibility

OptimaPak C18, 5 μ m



Column to column reproducibility

OptimaPak Sil, 5 μ m



● Test Chromatograms

Column: OptimaPak C18-51002546

250mm x 4.6mm

Testing Condition

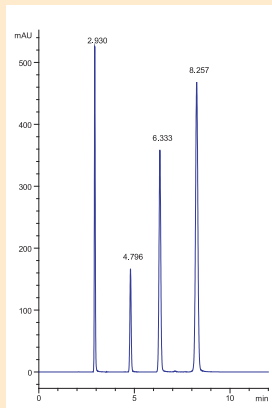
Mobile Phase : MeOH/H₂O : 90/10
 Flow Rate : 1.0ml/min
 Detection : UV 254nm
 Temp. : 25°C

Peak No & Name : 1) Phenol
 2) Toluene
 3) Biphenyl
 4) Phenanthrene

Ret. Time(Min) : 1) 2.930
 2) 4.796
 3) 6.333
 4) 8.257

Plate Number : 1) 18948
 2) 23978
 3) 22808
 4) 20941

Asymmetry : 1) 1.14
 2) 1.06
 3) 1.03
 4) 1.00



Column: OptimaPak C8-51002546

250mm x 4.6mm

Testing Condition

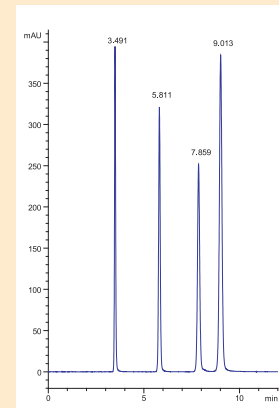
Mobile Phase : MeOH/H₂O : 80/20
 Flow Rate : 1.0ml/min
 Detection : UV 254nm
 Temp. : 25°C

Peak No & Name : 1) Phenol
 2) Toluene
 3) Biphenyl
 4) Phenanthrene

Ret. Time(Min) : 1) 3.491
 2) 5.811
 3) 7.859
 4) 9.013

Plate Number : 1) 17119
 2) 22690
 3) 22397
 4) 20685

Asymmetry : 1) 1.18
 2) 1.07
 3) 1.04
 4) 1.05



Column : OptimaPak SIL-51002546

250mm x 4.6mm

Testing Condition

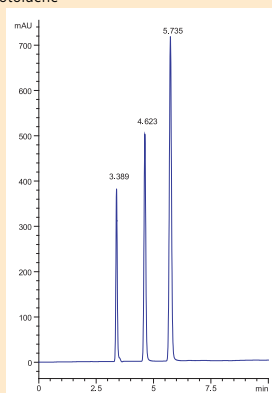
Mobile Phase : Heptane/EA: 90/10
 Flow Rate : 1.0ml/min
 Detection : UV 254nm
 Temp. : 25°C

Peak No & Name : 1) Ethylbenzene
 2) 2-Chloro-6-nitrotoluene
 3) Nitrobenzene

Ret. Time(Min) : 1) 3.389
 2) 4.623
 3) 5.735

Plate Number : 1) 14216
 2) 16900
 3) 17009

Asymmetry : 1) 1.18
 2) 1.08
 3) 1.05



Column : OptimaPak NH2-51002546

250mm x 4.6mm

Testing Condition

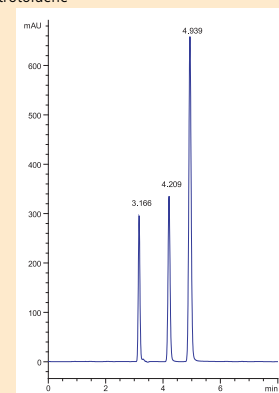
Mobile Phase : Heptane/EA: 90/10
 Flow Rate : 1.0ml/min
 Detection : UV 254nm
 Temp. : 25°C

Peak No & Name : 1) Ethylbenzene
 2) 2-Chloro-6-nitrotoluene
 3) Nitrobenzene

Ret. Time(Min) : 1) 3.166
 2) 4.209
 3) 4.939

Plate Number : 1) 13991
 2) 16814
 3) 16984

Asymmetry : 1) 1.10
 2) 1.09
 3) 1.08



● Product List

- All columns are individually tested and delivered with a test chromatogram.
- OptimaPak 5 μm or 10 μm in 21.2 mm ID columns are available upon customers request.

| Phase | Particle size | Pore size | Length \times ID | Part No. |
|---------------|-------------------|-----------|---------------------|------------------|
| OptimaPak C18 | 5 μm | 100 Å | 150 \times 4.6 mm | OP C18-51001546 |
| | 5 μm | 100 Å | 250 \times 4.6 mm | OP C18-51002546 |
| | 3.5 μm | 100 Å | 100 \times 2.1 mm | OP C18-31001021 |
| | 10 μm | 100 Å | 250 \times 10 mm | OP C18-101002510 |
| OptimaPak C8 | 5 μm | 100 Å | 150 \times 4.6 mm | OP C8-51001546 |
| | 5 μm | 100 Å | 250 \times 4.6 mm | OP C8-51002546 |
| | 3.5 μm | 100 Å | 100 \times 2.1 mm | OP C8-31001021 |
| | 10 μm | 100 Å | 250 \times 10 mm | OP C8-101002510 |
| OptimaPak NH2 | 5 μm | 100 Å | 250 \times 4.6 mm | OP NH2-51002546 |
| OptimaPak Sil | 5 μm | 100 Å | 250 \times 4.6 mm | OP Sil-51002546 |
| | 10 μm | 100 Å | 250 \times 10 mm | OP Sil-101002510 |